

6th International Conference on **Clinical & Experimental Cardiology** November 30-December 02, 2015 San Antonio, USA

Real time three dimensional echocardiography in valvular pulmonary stenosis among pediatric age group

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Background: Two Dimensional Transthoracic Echocardiography (2D -TTE) has been standard diagnostic imaging in patients with Pulmonary Valve Stenosis (PVS). Recent advances have been the development of real time three dimensional transthoracic echocardiography (RT 3D-TTE) matrix-array transducers. Right ventricular outflow tract and pulmonary valve was not studied before by RT 3-D TTE among children.

Objective: To determine the feasibility of RT 3D-TTE in the evaluation of PVS and measurement of pulmonary valve annulus (PVA), assess its reliability, reproducibility when compared with the standard 2D-TTE and invasive trans catheter angiography measurement.

Methods: Prospective clinical study included 30 pediatric patients with mean age 2.76 years diagnosed with pulmonary valve stenosis were assessed by 2D-TTE 3D-TTE and transcatheter angiography.

Results: Trans catheter angiography sizing of (PVA) diameter had higher Pearson's correlation coefficient with RT 3-D TTE measurements ($r = 0.909$ & 0.812 respectively) than for 2-D TTE ($r = 0.752$). Measurements of PVA by the three techniques were compared with the reference standard by means of a Bland-Altman plot. Smallest mean absolute difference was obtained between (PVA) measurement trans catheter angiography ($0.01(-0.07)$ cm) and RT 3D TTE diameter ($0.01(-0.09)$ cm) rather than 2D TTE ($0.11 (-0.06)$ cm). Interobserver reproducibility was calculated by means of intraclass correlation coefficient (ICC) of 2D-TTE was 0.983 (CI 95% $0.969 - 0.991$; $P < 0.001$). Similarly, the value obtained with 3D-TTE was 0.981 (CI 95% $0.965-0.990$; $P < 0.001$).

Conclusion: RT 3D-TTE assessment of PVA is a feasible, reliable and reproducible imaging among children with PVS.

Biography

Sahar Shaker Sheta has graduated M.B.B.Ch from the Faculty of Medicine, Cairo, Egypt 1989 and was signed up excellent. She has completed M.Sc. in Pediatrics in 1994. She has done M.D in Pediatrics and Pediatric Cardiology in 1998. She is the Professor of Pediatrics and Pediatric Cardiology in the Department of Pediatrics since 2009. She is also the Head and Director of Non Invasive Echocardiography Lab., Cairo University Children's Hospital 2014. She has published more than 15 papers in reputed journals both nationally and internationally. She has been an invited speaker and chairperson in several international Pediatric cardiology conferences in USA, Europe and Middle East.

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